compete for the provision of interconnection[34] and allow wireless carriers to remain competitive in their provision of wireless service. Fair and nondiscriminatory contracts allow carriers to meet customer demands by bringing them new and improved services in a timely fashion, and should not be discarded for tariffs.

2. Tariffed interconnection would harm small carriers and new entrants.

Contrary to Commission goals, tariffs would actually harm small carriers and new entrants to the market place. Carriers need interconnection that precisely satisfies their demands. Smaller carriers and start-up services would disproportionately suffer if interconnection were "one size fits all."[35] A number of smaller carriers have supported good faith negotiation before the California Public Utilities Commission;[36] indeed, a wide variety of telecommunications competitors, with very diverse interests,

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[34] With wide toll-free calling areas, it is commonplace for wireless carriers desiring interconnection to have a choice between LECs. Thus, LECs often compete for the opportunity to provide interconnection to wireless carriers.

[35] Response by Los Angeles Cellular Telephone Company (U-3009-C) to Application for Rehearing of Decision 94-09-085 by GTE California Incorporated (U-1002-C) at 1 (June 7, 1994), on file in Cal. PUC Proceeding.

[36] Despite strong cellular carrier sentiment to the contrary, the California PUC decided to require tariffing of interconnection arrangements. This places California in the distinct minority of jurisdictions in which GTOCs operate. In the 28 states in which GTOCs are certificated, only 4 require tariffing of interconnection arrangements.

supported negotiation and opposed Pacific Bell's request that the California PUC institute tariffs.[37]

Tariffs would also add unnecessary administrative costs to interconnection arrangements[38] without the additional benefit of fulfilling carriers' exact needs. Although there are costs associated with contractual negotiation, these costs are substantially less in comparison to a tariffed system of interconnection, and the expense of tariff regulation would ultimately be borne by the end user.[39] For these reasons, the Commission should maintain its current system of good faith negotiation of interconnection contracts and avoid instituting a tariff system for interconnection.

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[37] Response of the Cellular Carriers Association of California to the Application for Rehearing of Decision 94-04-085 GTE California Incorporated (U 1002 C) at 2-3 (June 8, 1994), filed in Cal. PUC Proceeding.

[38] It is clear that tariffs would burden both carriers and the FCC's resources. McCaw opined that tariffs would essentially "shift the onus of analyzing and negotiating interconnection arrangements from the carriers" to the regulator. Protest of McCaw at 3.

[39] In GTE's experience, negotiating interconnection arrangements is more resource-efficient than tariffing them. Unlike the negotiation process, which emphasizes consensus, the tariff process encourages the resolution of conflict via a lengthy process of administrative and judicial review. For example, GTE California Incorporated, a GTOC, filed an interconnection tariff on June 8, 1992 with the California PUC. Two years later the tariff is still not effective.

3. Sufficient regulation already exists to protect against discrimination in interconnection contracts.

Effective statutory and regulatory controls currently exist to protect carriers from discriminatory interconnection arrangements. Section 201(a) of the Communications Act, for example, requires that every common carrier establish physical connections with other carriers as ordered by the Commission. Section 201(b) of the Act requires that all charges and practices for connection be reasonable. Section 202 of the Act states that unjust or unreasonable discrimination in charges, practices, classifications, regulations, facilities, or services for or in connection with like communications service are unlawful, and that any undue or unreasonable preference or advantage to any particular person in that regard is also unlawful.

In addition to statutory protection, the Commission has also established regulatory policies to protect carriers from discrimination in interconnection. The Commission has specified that LECs must provide either Type 1 or Type 2 connection upon the request of a cellular carrier. FCC Policy Statement at 1284, app. B. This combination of statutory and regulatory policies has encouraged the provision of interconnection on non-discriminatory terms.

B. A "Most Favored Terms" Guarantee Is Unnecessary for Interconnection Contracts between LECs and CMRS Carriers

GTE does not believe that a "most favored terms" guarantee is necessary as part of the good faith negotiation process. Based on GTE's experience, "most favored terms" or similar guarantees prove to be both ambiguous and amorphous when subjected to legal interpretation. Ambiguity can lead to lengthy litigation which may interfere with the provision of service to customers and drive up prices.

The GTOCs, in all of their interconnection contracts with wireless carriers, include a provision by which the GTOCs covenant not to discriminate. This is not an empty pledge; it is the GTOCs' practice. If one carrier negotiates an interconnection arrangement with a GTOC, and a second carrier negotiates an identical interconnection arrangement with better terms and conditions, the GTOC unilaterally offers to negotiate a new contract with the first carrier based upon the terms and conditions in the second carrier's contract.

Given the difficulties that may foreseeably arise with the use of a "most favored terms" clause, the anti-discriminatory practices of carriers such as the GTOCs, and the protection already afforded by the Commission and the

Communications Act,[40] GTE suggests that such a guarantee is unwarranted, and may actually have adverse results.

C. Interconnection Agreements between LECs and CMRS Carriers Need Not Be Filed with the Commission

GTE believes that the costs, both to the Commission and the industry, of filing executed interconnection contracts far outweigh any benefits such a requirement might provide. New CMRS entrants will quickly and easily be able to evaluate the interconnection arrangements between LECs and existing CMRS providers and will not be in a disadvantaged bargaining position. Mandating this costly requirement prior to establishing a bona fide need for such action would be neither prudent nor warranted.

At some later time, should experience indicate a need to revisit this matter, GTE proposes that far more cost-efficient approaches are available than requiring the Commission to assume the role of librarian or custodian for the thousands of possible interconnection contracts. Given all the other constraints against discrimination, the requirement to file executed contracts is unneeded, costly and should be avoided.

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[40] See supra Part IX, Section A, Subsection 3 for discussion of Sections 201 and 202 of the Communications Act.

X. Market Forces, Rather Than Regulation, Should Determine Interconnection Among CMRS Providers, and CMRS Resellers Should Not Be Allowed to Connect Directly to a CMRS Switch

A. CMRS Carriers Should Not Be Required to Interconnect with Other CMRS Providers

The proper venue for determining the necessity of interconnection among CMRS carriers is the marketplace, where the market forces of supply and demand will dictate whether such connection is desired or essential. CMRS carriers should not be required to provide interconnection to all other CMRS carriers or resellers.

With the emergence of wide-area SMR and PCS, GTE predicts that the competition among carriers will be so fierce that those carriers that desire interconnection with other CMRS providers will, for economic reasons, interconnect as the market dictates. In order to properly allow the market to function, however, interconnection should be an option, and not a requirement.

B. CMRS Resellers Should Not Be Permitted to Connect Directly to the Switches of CMRS Licensees

CMRS resellers should not be permitted to interconnect directly with the switches of CMRS carriers. Direct connection to a carrier's switch would not provide any benefits to the end user and would not be in the public interest.

For cellular carriers, costs would likely increase due to such connection. Reseller connection to cellular carriers' switches would require the addition of ports to

the cellular switch to accommodate inter-switch trunks, an expense that would not be offset by any supposed savings to cellular carriers. Cellular carriers would receive little, if any, benefit from resellers' adoption of number administration duties; such functions can be currently performed automatically by a computer, and the cost savings to cellular carriers are negligible. In addition, neither resellers' purchase of their own NXX codes nor their payment to LECs for traffic termination would counterbalance the cost to cellular carriers of providing such interconnection.

Resellers have also claimed in the past that the ability to connect directly to a cellular carrier's switch would result in an increase in services to customers. However, the "new" services that resellers have proposed to provide are either presently available for resellers or could be made available for resale without reseller connection to cellular carriers' switches. Thus, reseller connection to cellular carriers' switches would not increase the introduction of new or innovative services.

XI. All CMRS Providers Except ATG Providers Should Be Subject to the Same Obligation to Provide Resale of Service

The Commission has asked that commenters discuss whether CMRS providers should be under the same obligation as cellular carriers to provide resale of their services. GTE believes that the Commission's policy prohibiting

restrictions on resale should be extended to all CMRS providers except ATG providers.

A. The Commission's Long-Standing Policy of Prohibiting Resale Restrictions Should Be Applied Equally to All CMRS Providers Except ATG Carriers

In the mid-1970's, the Commission repeatedly found that carriers should not preclude the resale of private line services through tariff provisions. Regulatory Policies Concerning Resale and Shared Use of Common Carrier Services and Facilities (Report and Order), 60 F.C.C.2d 261 (1976), modified on other grounds, 62 F.C.C.2d 588 (1977), aff'd sub nom, American Tele. & Tele. Co. v. F.C.C., 572 F.2d 17 (2d Cir.), cert. denied, 439 U.S. 875 (1978). Tariff provisions restricting resale were found to violate Sections 201(a) and 202(b) of the Communications Act of 1934. Id. The Commission later adopted a "blanket" policy prohibiting tariff restrictions on resale. Regulatory Policies Concerning Resale and Shared Use of Common Carrier Domestic Public Switched Network Services (Report and Order), 83 F.C.C.2d 167, 193 (1980).

The Commission expanded its resale policy to include cellular carriers in Cellular Communications Systems. Cellular Communications Systems at 511. However, in 1992, the Commission narrowed the scope of cellular resale by permitting a cellular carrier to deny resale to its facilities-based competitor after that competitor's fill-in period had expired. Petitions for Rule Making Concerning

Proposed Changes to the Commission's Cellular Resale Policies (Report and Order), 7 F.C.C. Rcd 4006, 4009-10 (1992).

The Commission's cellular resale policy was instituted to promote competition. Cellular Communications Systems at 511. As new CMRS carriers enter the market, there should be a concomitant requirement placed upon them to provide capacity for resale. By requiring new entrants to support resale, the Commission can be assured that customers can choose among a wide variety of wireless service providers. However, ATG providers should not be required to provide resale due to the numerous technological limitations of ATG which are discussed in Section B below.

B. Resale Should Not Be Required of ATG Providers

Resale obligations should not be imposed on air-to-ground ("ATG") providers.[41] There are significant technological limitations that distinguish ATG from cellular

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[41] The Commission applied a limited resale obligation to ATG only during its nascent period. The Commission required GTE Airfone to provide resale service to other ATG carriers to minimize "headstart" concerns when Airfone was operative but other ATG carriers had not yet constructed their facilities. See Amendment of the Commission's Rules Relative to Allocation of 849-851/894-896 MHz Bands (Memorandum Opinion and Order), 6 F.C.C. Rcd 4582 (1991). By that Memorandum Opinion and Order, the Commission ruled that GTE Airfone had to resell its services--but only until the other carriers were operational. The Commission stated, "[w]e believe that the situation with regard to the implementation of ATG service is similar to that which existed during the early development of cellular radio. There the Commission found it necessary to require the resale of cellular radio service in order to develop a competitive market." Id. at 634. No ATG carrier requested resale capacity.

and other CMRS carriers, rendering the provision of resale an impossibility. Resale is also unnecessary for healthy ATG competition.

1. Technological barriers to ATG resale.

a. There are no uniform standards for ATG transmission facilities.

As discussed previously in Part VIII, Section D, Subsection 2, supra, unlike cellular service, in which the Commission mandated equipment compatibility,[42] the Commission gave ATG permittees free reign to design their own unique systems. In fact, the Commission determined that licensees should not have to publish their technical standards because they might be "proprietary." Id. at 3874.

Not surprisingly, each of the three extant ATG carriers developed its own system which is incompatible with the other two. Unfortunately, interoperability of equipment is a prerequisite for economic resale. For example, resale of cellular service is easily accomplished and economically feasible because each system utilizes compatible specifications and end users can utilize their CPE in any cellular system. ATG's lack of uniformity makes it impossible to transplant resale concepts from the cellular context into ATG. ATG's lack of uniformity creates the following conditions that inhibit, if not preclude, resale:

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[42] The Commission requires all cellular equipment to be capable of operating in any cellular system in the United States. See 47 C.F.R. § 22.915.

1) handsets which are not interchangeable between ATG carriers; 2) the unwillingness of commercial airlines to carry more than one type of ATG radio; and 3) the expense of removal and replacement of incompatible ATG systems on aircraft necessary to support resale.

Assuming arguendo that these hurdles could be vaulted, the imposition of resale would require that ATG carriers disclose, for the first time, key operating specifications to resellers. This is the very information that the Commission recognized as proprietary. See ATG Order at 3874. GTE is also concerned that requiring disclosure of this information will chill future technological efforts. (See Part VIII, Section C, infra.)

b. ATG's narrow bandwidth prevents resale of ATG service.

ATG communication is transmitted on a very narrow bandwidth. The number of calls that can be made from the aircraft depends on the number of transceivers on board the aircraft. Thus, communication "lines" to the aircraft are few. In these circumstances, it is not feasible for the ATG provider to permit resale in bulk the way landline and cellular carriers can: capacity on board a particular aircraft is extremely limited.[43]

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[43] GTE Airfone expects to expand its call capacity to sixteen when it digitizes its equipment. However, sixteen calls are still too few for ATG carriers to realistically provide resale.

c. The requirement for ATG carriers to share spectrum renders resale unworkable.

The Commission requires ATG carriers to share, on a dynamic basis, the narrow band of spectrum which has been allocated to ATG. ATG Order at 3869. Thus, unlike cellular service, which has neatly drawn channel allocations for wireline and non-wireline carriers, ATG carriers must share spectrum on an "as available" basis. How resellers could be shoehorned technologically into such a dynamic environment is beyond GTE's ken.

2. Resale is unnecessary for healthy ATG competition.

Resale obligations were established in cellular due to the Commission's desire to increase competition between the two licensed carriers in each market. Cellular Communications Systems at 511. As indicated in Part VIII, Section A, Subsection 1, supra, ATG has an open entry policy in which new competitors are able to apply for construction permits at any time the FCC designates, subject only to spectrum availability. ATG Order at 3869. With the three existing ATG carriers, it is clear that the market is competitive; on its own review, the Commission has found that ATG carriers are non-dominant. CMRS Second Report and Order at 1469, ¶ 144.

Given the competitive nature of the ATG market and the continuing ability for new entrants to participate, GTE believes that resale, even if feasible, would not provide

any significant competitive impetus. The Commission's treatment of ATG to date has maximized competition and eliminated the need to impose a resale obligation.

XII. Conclusion

Equal Access should not be mandated for cellular or other CMRS providers today, and in the future wireless environment, Equal Access will be even more unnecessary. Today's wireless environment has changed greatly since the MCI Petition comments were filed. Major developments have occurred in the wireless marketplace which will afford the public the ability to choose among eight or more wireless carriers in any given market. Thus, the marketplace, rather than regulations, will ensure that wireless customers' demands are met.

Equal Access should not be imposed upon cellular carriers as cellular carriers do not control bottleneck facilities and there has been no finding that cellular carriers exercise market power. To the contrary, the CR study of competition in the wireless marketplace found that the cellular industry evidenced substantial competition and that the emergence of PCS and wide-area SMR providers will significantly increase competition.

Given the ability today for cellular subscribers to select IXCs, mandating 1+ Equal Access is unwarranted and cannot be justified by a benefit-cost analysis. However,

GTE undertook a benefit-cost analysis of the implementation of Equal Access which demonstrates that the costs far outweigh the benefits. GTE estimates that implementation of Equal Access would cost GTE in excess of $23,000,000. Added to that expense are the significant costs that each cellular subscriber would incur, in the form of additional IXC charges, if wide toll-free calling areas are reduced or eliminated. In addition, the implementation and continued administration of Equal Access would involve substantial expenditures of the FCC's resources for years to come. Any benefits that might accrue from Equal Access are diminished by the technical infeasibility of providing complete Equal Access on all cellular calls and, at least in GTE's experience, the small percentage of cellular traffic that is routed to an IXC. On balance, costs far outweigh potential benefits.

The vibrant competition of the ATG market coupled with the ability of ATG end users to select their IXCs by utilizing IXC access undermines any rationale for the placing of Equal Access upon ATG carriers.

GTE believes that the Commission's policy requiring good faith negotiation of interconnection arrangements has worked well and need not be changed. Rather than establish interconnection requirements for new CMRS providers, GTE suggests that the decisions of whether a CMRS carrier will interconnect with another and the manner in which they

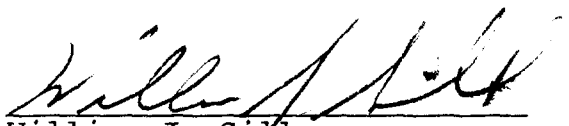
interconnect are best left to marketplace forces. GTE supports extending resale requirements to all CMRS providers excluding only ATG as costs and technical limitations render the provision of resale impractical.

Decisions made in this docket will affect the manner in which cellular, ATG, and other CMRS services are provided in the future. A decision to impose Equal Access on cellular and ATG carriers would be without sufficient legal foundation and could not be justified under a benefits-cost analysis. The very concept of Equal Access in the wireless context is outmoded in a marketplace which sets numerous wireless carriers free to compete for the same subscribers. GTE respectfully submits that the best direction for the Commission to proceed is to nurture the market forces which today motivate cellular carriers to: 1) develop and expand cellular calling areas; 2) improve the quality of cellular service; and 3) develop and implement new technology and services. The imposition of Equal Access would represent a step backwards and could eliminate one of the fruits of the competitive cellular marketplace--wide toll-free calling areas.

For these reasons and others discussed infra, GTE urges the Commission not to impose Equal Access on non-RBOC cellular carriers and ATG carriers.

Respectfully submitted,

GTE Service Corporation and its affiliated GTE Telephone and Personal Communications Companies



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September 12, 1994

ATTACHMENT A

Charles
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CONCENTRATION, COMPETITION, AND PERFORMANCE IN THE MOBILE TELECOMMUNICATIONS SERVICES MARKET

Stanley M. Besen

Charles River Associates

September 9, 1994

EXECUTIVE SUMMARY

This paper examines both the performance of the mobile telecommunications services industry during its first decade and the impact of changes in industry structure and capacity that will occur in the next. It concludes that the performance of the cellular industry has been consistent with what would be expected in a competitive market and that industry concentration will decrease greatly with the advent of the use of PCS and ESMR technologies. The effect of these developments is to reduce further the need for new regulations of cellular services. The entry of new firms and the introduction of new capacity promise soon to do effectively what regulation can do only highly imperfectly -- reduce the prices and improve the service offerings that are available to mobile service consumers.

INTRODUCTION

In a series of decisions extending over a number of years, the Federal Communications Commission has demonstrated an increasing recognition that the market for mobile telecommunications services is broad and growing, and that its regulation warrants a flexible approach. In its 1981 Report and Order authorizing cellular communications systems on a commercial basis, the Commission concluded that licensing two cellular carriers in each service area would best serve the public interest, convenience, and necessity. In establishing this duopoly structure, the FCC sought to balance the benefits arising from economies of scale with those resulting

from competition.[1] Subsequently, the Commission determined that it should license additional spectrum to the two cellular carriers as the services they offered proved highly popular with users.[2]

More recently, in its various Personal Communications Services (PCS) orders, the Commission has expanded on its flexible approach to the regulation of mobile telecommunications services.[3] First, it has allocated a substantial amount of additional spectrum for the provision of these services, further expanding the resources that are available for their provision. Second, it plans to auction a number of large spectrum blocks, and will permit subsequent combinations of blocks, to permit economies of scale in the provision of mobile services to be exploited. Third, while recognizing the importance of these scale economies, in order to limit industry concentration, the Commission has constrained both the amount of PCS spectrum that can be licensed to any single entity in a given geographic area and the amount of spectrum that can be licensed to cellular incumbents in either the PCS auctions

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[1]Report and Order in the Matter of an Inquiry into the Use of the Bands 825-845 MHz and 870-890 MHz for Cellular Communications Systems; and Amendments of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, CC Docket No. 79-318, adopted April 9, 1981; 86 FCC 2nd 469 (1981). Only seven years before, noting the technical complexity and expense of cellular systems, together with the large amount of spectrum required for their economic viability, the FCC had concluded that only one cellular system should be licensed in each service area (Second Report and Order in Docket No. 18262, 46 FCC 2nd 752 (1974)).

[2]Amendment of Parts 2 and 22 of the Commission's Rules Relative to Cellular Communications Systems, 2 FCC Rcd 1825 (1986).

[3]See, e.g., Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, Adopted September 23, 1993.

or the aftermarket.

Finally, and perhaps most importantly, by broadly defining PCS as "a family of mobile or portable radio communications services which could provide services to individuals and business, and be integrated with a variety of competing networks,"[4] the Commission has chosen to give substantial latitude to operators to offer a wide range of services under the PCS rubric. Thus, if some mobile services prove popular, and thus profitable to provide, PCS operators will be able to offer these services without seeking regulatory approval to do so.[5]

The flexibility being afforded to PCS operators, which will permit them to offer either "traditional" cellular telephone service or newer value-added services, is especially appropriate in view of the significant uncertainty about precisely which mobile telecommunications services consumers will desire. At present, PCS remains a somewhat vaguely defined term, with a wide range of interpretations. Some have described PCS as the third phase in the

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[4]Notice of Proposed Rule Making and Tentative Decision, In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, ET Docket No. 92-100, released August 14, 1992, para. 29 (hereinafter "Notice").

[5]The Commission has also granted flexibility to cellular incumbents to offer PCS-like services in Report and Order In the Matter of Liberalization of Technology and Auxiliary Service Offerings in Domestic Public Cellular Radio Telecommunications Service, 3 FCC Rcd 7033 (1988); Memorandum Opinion and Order In the Matter of Liberalization of Technology and Auxiliary Service Offerings in Domestic Public Cellular Radio Telecommunications Service, 5 FCC Rcd 1138 (1990); and Second Report and Order In the Matter of Amendment of the Commission's Rules to Establish New Personal Communications Services, 8 FCC Rcd 7700 (1993).

evolution of cellular technology, following service to automobiles and portable telephones. A second view has PCS comprising several varieties of digital communications technologies slated to become competitive alternatives to cellular services -- for example, CT-2 (second-generation cordless telephones) or Enhanced Specialized Mobile Radio (ESMR). A third view is that PCS is simply a synonym for wireless or mobile telecommunications services, one of which is cellular radio. Finally, perhaps the most amorphous characterization of PCS is "more spectrum for something else," that is, any and every new wireless concept that is proposed.[6]

While providers of cellular telephone services now offer a number of value-added services, including voice mail, call waiting, call forwarding, portable facsimile, and wireless transmission for laptop computers, PCS firms will be able to supplement these services by providing similar communications opportunities for customers in a host of possible environments (e.g., inbuilding, neighborhood, pedestrian), using various registration modes ("home," "roam"), and an array of voice or data instruments offering a range of integrated enhanced services.[7]

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[6]See G. Calhoun, Wireless Access and the Local Telephone Network (Boston: Artech House, 1992), p. 573.

[7]Telocator lists 18 "Existing PCSs" and 5 "Emerging PCSs." Yet even these numbers understate the array of available service options, since there are many variations of each service. The FCC has authorized over 150 PCS experimental licenses in the past few years. Other possible offerings include advanced digital cordless phone service, wireless private branch exchange (PBX), wireless local area networks (LANs), wireless data transfer and advanced paging, high-speed local-area data communications services connecting personal computers ("Data-PCS"), and wireless local loop service; see the Notice, paragraphs 9, 10, and 18.

The term "cellular radio/telephone" was initially restricted to describing in-vehicle ("mobile") communications while "PCS" has often been used to describe handheld ("portable") communication devices. However, because the firms that will employ these technologies can compete to provide the same services -- cellular operators currently offer portable services while PCS suppliers are expected to offer mobile services -- they are all in the mobile telecommunications services market. Thus, whatever particular services are eventually offered by PCS and cellular providers, the introduction of PCS will increase both the amount of spectrum available to supply mobile services and the number of different firms that furnish these services.

PERFORMANCE IN THE PROVISION OF CELLULAR SERVICE

From its beginning, the business of supplying mobile telecommunications services using cellular technologies has been characterized by rapidly increasing volume, declining real prices, expanded service offerings, growing capacity, and significant technological change. In December 1984, there were fewer than 100,000 cellular subscribers in the United States with average monthly expenditures on cellular service of almost $500. The cumulative capital investment in the industry was then about $450 million and there were about 1,400 cell sites. Less than ten years later, in December 1993, there were more than 16 million cellular subscribers, average monthly expenditures were about $60, the industry was investing at a rate of more than $2.5 billion per

year, and there were almost 40,000 cell sites.[8] In addition, innovations in analog technologies (e.g., adjusted power input, antenna tilting, dynamic channel assignment) have enabled cellular operators to expand their capacity, while even more dramatic advances are expected from the further development and application of digital technologies.

By any measure -- subscribers, capital investment, cell sites -- the growth of the cellular industry has been spectacular during the first decade of its existence. Annual growth rates have been 77 percent for subscribers, 49 percent for cell sites, and 48 percent for capital investment over the period since 1984.[9] And the rates of growth of these indicators continue to be exceptionally strong. Between December 1992 and December 1993, the number of cellular subscribers increased almost 50 percent, cumulative capital investment grew by 22 percent, and the number of cell sites grew by more than ten percent.

Contributing to the increasing number of subscribers and the accompanying increase in the volume of use has been a steady decline in the costs of owning and using cellular telephones. For example, the real, i.e., inflation-adjusted, unweighted average of

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[8] The data on which these figures are based are from the Cellular Telecommunications Industry Association End-of-Year Data Survey. Revenue and capital investment data have been converted to 1993 dollars using the CPI All Services index for revenues and the PPI Capital Equipment index for capital investments. Average monthly expenditures are calculated as six-month revenues divided by 6 divided by the number of subscribers at the end of the period. Because subscribership is growing, this tends to understate the average subscriber bill during any period.

[9] Op. cit.

the lowest published rate for access and 250 minutes of usage during prime time in the ten largest cellular service areas in 1991 was only 62 percent of its 1983 level.[10] Similarly, the average of the lowest real price for the purchase of 150 minutes of airtime in the top 30 markets declined by 27 percent between January 1985 and January 1991.[11]

The same general pattern of declining real prices can be observed for cellular systems owned or controlled by GTE Corporation.[12] The unweighted average of the lowest real prices for systems in the top 100 MSAs in which Contel Cellular, Inc. had at least a 90 percent ownership interest declined by more than 20 percent between 1989 and 1993 for 30, 160, and 250 minutes of monthly use.[13] For GTE Mobilnet Incorporated systems, although the unweighted average of the lowest real prices for 30 minutes of monthly use were essentially unchanged between 1989 and 1993, average rates for 160 and 250 minutes declined by 18 and 19 percent, respectively.[14]

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[10]Data are from Herschel Shosteck Associates, Ltd., Cellular Market Forecasts, Data Flash, September 1992.

[11]General Accounting Office, Concerns About Competition in the Cellular Telephone Service Industry, GAO/RCED-92-220, 1992, p. 22.

[12]GTE Corporation is the parent company of both GTE Mobilnet Incorporated ("GTEM") and Contel Corporation ("Contel"). GTEM and Contel have numerous cellular subsidiaries.

[13]The calculations assume 80 percent peak and 20 percent off-peak usage.

[14]Collection of the underlying data and computation of the unweighted averages were performed by GTE. Inflation adjustments were performed using the CPI.